

Amendments to the Claims

Claim 1 (currently amended): A method for determining an endpoint of a cleaning process running in a chamber that comprises steps of:

directing radiation absorbed by a byproduct of the cleaning process into an exhaust line of the chamber;

detecting a measure of absorbance of the radiation by the byproduct;

wherein the measure of absorbance of the radiation is detected by detecting a measure of further radiation emitted by the byproduct in response to the radiation, detecting a measure of background radiation in the exhaust line, and the measure of absorbance represents a difference between the measure of further radiation and the measure of background radiation;
and

determining the endpoint when the measure of absorbance falls within a predetermined window;

wherein the predetermined window encompasses a value that corresponds to 100% cleaning of the chamber and less than 100% cleaning of a predetermined portion of the exhaust line.

Claim 2 (currently amended): A method for determining an endpoint of a cleaning process running in a chamber that comprises steps of:

directing radiation absorbed by a byproduct of the cleaning process into an exhaust line of the chamber;

detecting a measure of absorbance of the radiation by the byproduct; and

determining the endpoint when the measure of absorbance falls within a predetermined window;

The method of claim 1 wherein the predetermined window encompasses a value that corresponds to 100% cleaning of the chamber and less than 100% cleaning of a predetermined portion of the exhaust line.

Claim 3 (original): The method of claim 2 wherein the cleaning process is a dark cleaning process and the step of directing comprises directing infrared radiation.

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Claim 4 (original): The method of claim 3 wherein the step of detecting comprises detecting further radiation emitted by the byproduct after absorbing the radiation.

Claim 5 (original): The method of claim 4 wherein the step of detecting further comprises analyzing the further radiation using Fourier Transform Raman spectrometry.

Claim 6 (currently amended): The method of claim 5 wherein the step of detecting a measure of absorbance of the radiation by the byproduct further comprises generating an output signal representative of the measure.

Claim 7 (currently amended): The method of claim 6 wherein the step of determining comprises determining the endpoint when the output signal falls within a the predetermined signal window representation of the predetermined window.

Claim 8 (currently amended): The method of claim 6 wherein the step of generating further comprises multiplying the ~~a second~~ output signal by ~~by~~ [[is]] a predetermined amount ~~multiple of the output signal~~.

Claim 9 (currently amended): The method of claim 7 wherein the step of determining the endpoint when the output signal falls within the predetermined signal window comprises determining when the output signal falls below a predetermined level.

Claim 10 (original): The method of claim 9 wherein the byproduct is SiF₄.

Claim 11 (currently amended): An apparatus for determining an endpoint of a cleaning process running in a chamber that comprises:

a radiation source that transmits radiation absorbed by a byproduct of the cleaning process into an exhaust line of the chamber;

a detector that selects ~~detects~~ further radiation emitted by the byproduct in response to the radiation and outputs a first radiation signal and selects ~~a measure of~~ background radiation in the exhaust line and outputs a second radiation signal;

an analyzer that analyzes the first and second radiation signals ~~further radiation and the measure~~ to determine and generate a measure of absorbance of the radiation by the byproduct; and

a controller, in response to the measure of absorbance, that generates an endpoint signal when the measure of absorbance falls within ~~reaches~~ a predetermined window.

Claim 12 (currently amended): An apparatus for determining an endpoint of a cleaning process running in a chamber that comprises:

a radiation source that transmits radiation absorbed by a byproduct of the cleaning process into an exhaust line of the chamber;

a detector that selects further radiation emitted by the byproduct in response to the radiation and outputs a first radiation signal and selects background radiation in the exhaust line and outputs a second radiation signal;

an analyzer that analyzes the first and second radiation signals to determine and generate a measure of absorbance of the radiation by the byproduct; and

a controller, in response to the measure of absorbance, that generates an endpoint signal when the measure of absorbance falls within a predetermined window;

~~The apparatus of claim 11~~ wherein the predetermined window corresponds encompasses a value that corresponds to 100% cleaning of the chamber and less than 100% cleaning of a predetermined portion of the exhaust line.

Claim 13 (original): The apparatus of claim 12 wherein the cleaning process is a dark cleaning process and the radiation source comprises a source of infrared radiation.

Claim 14 (original): The apparatus of claim 13 wherein the detector comprises a filter that transmits the further radiation and a filter that transmits radiation in a band of wavelengths close to wavelengths of the further radiation.

Claim 15 (original): The apparatus of claim 14 wherein the analyzer comprises a Fourier Transform Raman spectrometer.

Claim 16 (currently amended): The apparatus of claim 15 wherein the analyzer generates the measure of absorbance as an output signal ~~representative of the measure~~.

Claim 17 (currently amended): The apparatus of claim 16 wherein the controller generates the endpoint signal when the output signal falls within a predetermined signal window representative of the predetermined window.

Claim 18 (currently amended): The apparatus of claim 17 wherein the controller generates the endpoint signal when the output signal falls below a predetermined level in the predetermined window.

Claim 19 (currently amended): The apparatus of claim 18 wherein the
byproduct is SiF₄.